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THE UNITED STATES ON A MORE SECURE WORLD BASIS
(The Strategic and Critical Materials)*

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THE QUESTION OF SELF-SUFFICIENCY

The traditional idea of self-sufficiency is not considered here. Instead, the writer has substituted the idea of a Greater United States which extends beyond the continental limits as an alternative to a more equitable world-wide distribution of essential materials. It is based primarily on the idea of the United States gaining some measure of control over enough vital resources to render it self-sufficient in terms of strategic and critical materials, and rendering defensible during periods of war, insofar as practical and possible, all vital military resources over which it has control during periods of peace.

Lack of space prohibits detailed consideration of basic statistics used and of the many problems involved.† The study is necessarily limited in scope and hinges largely on production and consumption figures centering about the year 1938. Detailed consideration of reserves, substitutes, war-time versus peace-time needs, and similar problems, is not attempted.

* This paper is really a sample illustration of procedure suggested in the project on "National Self-Sufficiency" appearing in the January, 1942, issue of the JOURNAL. For a full appreciation of the line of thought presented here, the reader is referred to that issue. The writer has a threefold objective in mind:

a. Information for anyone who may read it.

b. A guide for the teacher who may make use of the project. The project is theoretically developed largely as one student might do it. In different hands it may assume a variety of completed forms.

c. Stimulation of interest. There may be hearty disagreement on the part of the reader relative to some of the ideas suggested here. However, if the reader is stimulated to do constructive thinking, a major objective will have been accomplished.

† For basic statistics see the February, 1942, issue of the JOURNAL.

Estimates of the war-time increase over peace-time needs of a given commodity run as high as 300 per cent. The Army and Navy Munitions Board estimates an increase of 35 per cent in the amount of mercury needed (based on World War experience) and of 50 per cent in the case of manganese (based on percentage of full capacity on which steel facilities were operating at the time of the estimate). Persons making estimates often fail to consider all pertinent factors. No individual really knows (in the case of any specific material) just how much might be saved, reclaimed, discovered, substituted for, or produced at a price, for civilian and military needs in case a real test were made. Nor does anyone know just what it would require in the nature of specific or total materials to place the United States on a self-sufficient basis at any one time a few years hence. Such factors as substitutes, more efficient use, and new discoveries may greatly alter our present concepts. Fairly close estimates may be arrived at for the present and the immediate future.

Perhaps little or no increase in imports of many selected commodities over peace-time levels would be necessary in order to insure military efficiency. Certainly, if wise use were made of each commodity, and each were reserved for its most indispensable uses, the absolutely necessary quantity of each could be held to a much lower point than otherwise.

This wisdom of rendering secure a supply of vital military materials is established. It is well recognized by the student of military affairs that the outcome of modern warfare may depend immeasurably on the slightest efficiency advantage of one war machine over another. It is also a well established fact that the efficiency of the war machine in action depends greatly on the efficiency of the set-up in civilian life. A well-informed, efficient government will carefully allot vital materials and enforce substitutes with the total national efficiency in mind.

Considerations included here are based on the assumption that the normal state of future civilization will be comparatively long periods of peace as compared to possible short periods of war, war in which only a portion of desirable foreign resources would be denied the United States at any one time. There are many convincing arguments against the United States attempting total self-sufficiency on a peace-time basis, thereby removing itself from world affairs. This would require considerable adjustment in food, clothing, travel, and other habits of living. Inasmuch as considerable

adjustment must be made whether total self-sufficiency be attempted on either a peace-time or a war-time basis, it could probably be more easily and speedily accomplished during a period of emergency because of the stress under which the changes would materialize.

In reading further, the reader should not lose sight of the possible and desirable part the United States might play in encouraging and effecting a world-wide peace-time equitable distribution of the essential materials among all nations. Such a world-wide agreement among nations of peaceful intent, operating in a world at peace, would render unnecessary precautions which it would be logical for a nation to take otherwise.

Methods of Attaining Self-Sufficiency

On the assumption that the major world powers may find themselves unable to arrive at an equitable distribution of essential materials, the United States may approach or attain practical self-sufficiency in various commodities by one or more of several methods, such as the ones suggested:

1. By acquiring political and economic control over those commodities which are considered indispensable, of which it uses fairly large quantities, produces none, and is possibly incapable of producing. These are commodities for which there are either no adequate substitutes, or for which it would require considerable time or expense, or both, to develop to a substantial basis. (Example: Rubber)
2. By acquiring long-time stocks of those materials, indispensable in small annual quantities, which the nation is unable to produce now and of which there is little likelihood of its becoming able to produce in the future. (Example: Quartz crystal)
3. By reclaiming material from scrap whenever it is deemed necessary. (Example: Aluminum collections)
4. By strict governmental regulation which would assure smooth functioning of the military machine at maximum efficiency. (Example: Aluminum priorities)
5. By acquiring stocks of those commodities which are not now produced, but which could be produced, for the number of years it would be necessary for the United States to develop production to a self-sufficiency basis. (Example: Silk stocks)
6. By substitution (1) whenever the military machine, the first consideration, would not be impaired, and (2) in civilian life, where the substitutes are usually less consequential.
7. By temporarily modifying food and clothing habits, when necessary, to carry the country thru an emergency. Obviously, a consideration of the diet and clothing of the military forces should come first, those in civilian life bearing the initial unpleasant aspects of the change.
8. By holding in reserve limited deposits or low grade deposits of vital metals and other materials, but with governmental plans for efficient development in case of emergency.
9. By supporting peace-time staffs to keep up-to-date surveys on the current situation relative to important materials.

10. By supporting able laboratory staffs of research workers to find substitutes and to develop a more efficient use of present materials.
11. By providing that efficient transportation facilities be maintained to insure proper movement of desired materials.

A SELF-SUFFICIENCY SET-UP FOR A GREATER UNITED STATES

Altho by no means advocating a positive imperialistic policy on the part of the United States, the author has toyed with the idea of a United States rendered independent at a given date in terms of the vital materials listed by the Army and Navy Munitions Board. Inasmuch as the study has fascinated the author, a possible minimum map is passed on for the consideration of the reader. With political, strategic, and other considerations in mind, areas are considered which contain a sufficient amount of certain vital materials to render the United States self-sufficient on the basis of a peace-time economy. However, the total resources included, combined with the most intelligent procedure in connection with their use, might be ample to establish the United States on a war-time self-sufficiency basis which would carry it thru a major emergency. The reader should keep in mind that as time transpires the essential list of materials used here may be altered.

A. The Map

Tin and rubber are considered indispensable in our present set-up. British Malaya and the Dutch East Indies are, in peace-time, a stable source of supply for both items. Java produces both kapok and quinine. However, the United States could, if necessary, substitute the hair of over one-half million Alaskan reindeer for kapok.

The amount of tungsten produced in British Malaya and Borneo (almost 10 per cent of the world's production in 1936), added to the production and reserves of the United States, plus wise use, should be sufficient for its needs (The United States accounts for about 10 per cent of the world's production and uses about 20 per cent). Molybdenum (the United States produces about 80 per cent of the world's supply and consumes about 30 per cent) could, if necessary, be substituted in large measure for tungsten.

The following areas might well be considered in connection with chromium, manganese, mica, graphite, and possibly rubber:

1. Southern Rhodesia;
2. Union of South Africa;
3. New Caledonia;
4. Gold Coast;
5. Madagascar;
6. Liberia.

Both the selection of high grade ores and suitable production areas is involved in the manganese problem. To be suitable for use in the manufacture of 78-80 per cent ferromanganese, the alloy essential to the modern manufacture of steel, the ore must contain not less than 48 per cent manganese. Adequate production figures for various grades and of corresponding reserves are difficult to secure. The United States uses about 20 per cent of the world's production of manganese and produces an insignificant amount. Careful use of its own resources, substitution wherever possible, plus resources of the Gold Coast (9 per cent of the world's supply), the small amount produced in South Africa, and scattered production in other areas already listed might be sufficient to supply the United States.

Chromium ores containing $Cr_2 0_3$ and an iron content no greater than 1 : 3, in order to produce a melt that will yield 60 to 70 per cent chromium content, is necessary in modern iron manufacture. Chromium chemicals produced in the United States are made entirely from foreign ores. With the very high grade of ore from New Caledonia and the limited amount of high grade ores of the Union of South Africa and Southern Rhodesia, plus wise use, the United States would probably have an adequate supply of the proper grade of chromium (small quantities of high grade ores are mixed in the natural state with lower grade ores in Southern Africa). Altho the United States consumes about 40 per cent of the world's chromium production, it produces an insignificant amount.

The amount of foreign strategic block mica and critical graphite needed is not large in bulk or weight and could be readily stocked, if obtainable. Canada, the United States, and Mexico all produce a variety of the cheaper grades of graphite and could produce more if demand justified it. Madagascar is a valuable source of both high grade graphite and mica. Crucible makers insist on Madagascar flake graphite of suitable mesh size.

Liberia, a country about the size of the state of Virginia, is included on the map because of its unique position. The United States could develop a rubber industry here without trampling, politically speaking, on the toes of any other nations. Private capital from the United States is already responsible for about 10,000,000 rubber trees in Liberia (1938 estimate).

Fortunately, an adequate supply of nickel and asbestos is near the northern border of the United States in friendly Canada.

Canada could also supply the United States with much platinum and low grade graphite. However, self-sufficiency in platinum, at least for a time, could be attained by utilizing some of that already manufactured. Altho the United States could be self-sufficient in mercury for a period, the addition of Mexico's production would provide mercury far in excess of the normal peace-time needs. Mexico is also a dependable source of low to medium grade graphite. The United States has large untouched reserves of medium to low grades of graphite.

Without radical changes in the composition of wearing apparel and other fiber materials of certain types, the United States would still be dependent on foreign sources for considerable apparel wool (an amount equal to about one-half as much as is annually produced in the United States). The nation could be self-sufficient in hides, if proper substitutes were instituted, except for the heavy quality used chiefly for sole and shoe leather. With substitution wherever possible, perhaps even this need could be satisfied. One must keep in mind, however, the availability of the logical substitute materials in problems of this type, such as rubber for sole leather. Hides will keep for several years with little depreciation if properly stored. New Zealand and Australia produce enough of the proper types of wool and hides to supply the import needs of the United States.

B. Stores

Stocks of certain materials which are highly important are required, but are not included on the proposed map of "Greater United States." Some of these are from major countries or are from areas where it would be highly inadvisable for the United States to attempt control or to assume any responsibility for protection. Fortunately, the stocks, in all cases, are of materials which can be largely substituted for, or of materials which do not spoil easily, or of those types which would not require considerable storage space for a long-time supply.

Rubber and other substitutes could largely take the place of cork. A small supply of cork should possibly be stored for special emergency use. If it is felt necessary to store vanadium, after proper substitutions are considered, it would not require a large amount. This is also true in the case of items other than vanadium. Molybdenum, an item in which domestic production far exceeds domestic needs, could be substituted for many of the uses of

vanadium and certain other metals. This example is illustrative of what might be done in many other cases of shortages of specified commodities. Proximity of the source of the vanadium supply (Peru) renders storage less expedient. A supply of tanning materials could be stored, altho it appears hardly necessary. Chemical substitutes are apparently about as good as vegetable sources and are being improved, but many tanners still prefer the foreign vegetable sources.

There are apparently no satisfactory substitutes for quartz crystal in radio frequency control, so small necessary amounts should be stored. Opium should be stored in necessary amounts, as it is still the most important medium for relieving pain. Long before the attack on Pearl Harbor, authorities were confiscating and storing enough morphine to carry the United States thru an emergency.

C. Domestic Production

Certain of the strategic and critical materials are being, or could be produced in the United States, its possessions, or its protectorates. This production could be expanded to ample amounts for the needs of the nation. This is true of coconut shell char, Manila fiber, aluminum, iodine, optical glass, phenol, and toluol. In cases where we are producing less than we use, a stock could be acquired sufficient to supply our needs until necessary domestic production could get under way.

Altho silk could be produced in the United States, economic and other considerations preclude its present production in commercial quantities. It appears that substitutes have advanced to the point that only a small reserve would be necessary. Substitutes for use of silk in powder bags in large caliber guns, especially in the navy, where a clean and full burning powder container is required, are less satisfactory than silk. Waste silk can be used for this purpose. If the government felt it necessary, plans could be drawn and held ready for putting into operation a small silk industry in case of extreme emergency.

D. Obtaining Control of Resources

The United States may obtain control or use of resources or areas by one or more methods, such as the following:

1. By outright force;
2. By extending protective custody;
3. By annexation;
4. Thru concessions or loans of money;
5. By alliances.

By proximity to some of the materials, the United States is practically assured of adequate supplies during periods of emergency. Other materials are farther removed. The nation has strongly condemned forcible seizure by a nation of areas not belonging to it. In case extreme emergency demanded it, outright force could be used as a last resort. Only in the latter case would such procedure be condoned by citizens of the United States and by the world as a whole.

There are occasions when the United States feels that it should extend protective custody over an area. Our actions in the cases of Iceland, Greenland, and Dutch Guiana are examples of this. Theoretically, the custody is exercised during the period of the emergency. However, as a result of political and other developments, the period of protection may extend indefinitely. At the present time, Madagascar and Martinique are examples of areas over which some nation may extend protective custody to prevent a foothold being gained by some other power. (The Axis powers constitute a threat at present.)

The concession method would be a likely procedure in some cases. Alliances, even to the extent of agreements of mutual defense might be made with some of the more independent units. The possibility of annexation deserves consideration.

A world-wide agreement, whereby essential materials would flow more freely in trade would, perhaps, be the most desirable method of gaining the use of vital materials and of perpetuating international peace and friendship. However, until all major nations are willing to agree to such a state and to support its administration, nations may logically feel that other measures must be taken in self-defense.

E. Considerations

Some of the reasoning in this paper may, at first thought, appear somewhat illogical and, perhaps, as an attempt to build up a "case." However, let us briefly examine the physical-political relationships of the indicated units and the United States in the present disturbed world set-up. Because of the proximity of Mexico and Canada, we are practically assured of the supplies of these countries, altho we could get along fairly well without the supplies of Mexico (graphite and mercury) even in a major emergency. The asbestos and nickel and other supplies of Canada, an English speaking country, are far more important. However, the

United States would unalterably oppose any forcible conquest of these two countries by foreign powers; so the nation would here have committed itself to no new obligation if it agreed to defend these countries for economic or other considerations.

A strong power, unfriendly to our interests and entrenched in the South Pacific, would be a challenge to the security of the United States. The nation has already engaged in an actual defense of the units indicated in this area. It is reasonable to assume that our future interests in this area will, in time, increase rather than decrease. Even during a period of peace the United States would hardly allow to go unchallenged any extension of supervision by an unfriendly power over a strictly Pacific area.

African areas bear a somewhat different relationship to the United States than do areas already considered. Altho the United States might hesitate to place itself in a position which might involve it in an African dispute, it would hardly stand by and see Liberia, over the administration of which it still exercises some control, taken over by some foreign power. To say the least, it would be greatly disturbed to see Madagascar or any other portion of Africa south of the Sahara fall into unfriendly hands. Both Liberia and the Gold Coast are near South America. Note the great concern about the possible fate of Dakar.

A question naturally arising is one concerning the difficulty of defense of the areas indicated. Except for France and England (at present one friendly and one weak power), the strong powers are considerably removed by land (note the type of land) and water from these areas, and all have quite vulnerable routes to them. From the standpoint of the Axis powers, Japan constitutes the greatest threat at present. The very location of the units makes them stepping stones around the world from the east to the west coast of the United States. They are also grouped in such a way as to make most of them more defensible than they might otherwise be. Power lines result naturally from their geographic positions.

Such a Greater United States as indicated would be essentially an English speaking union. Most of the areas are populated by people of British descent or are administrated by them. The administrations of the others are, in general, friendly to the United States. It appears that the future interests of the United States may be increasingly affected in many ways by the future of these areas.

The reader may feel that Latin America has been slighted in the setting up of the map. Many valuable materials are found there. However, Latin America lacks most of the strategic and critical materials in adequate amounts to accomplish the establishment of supplies necessary to our needs. Certainly, such items as the Brazilian manganese deposits and the tin of Bolivia are of great importance and should be considered in questions of world power. Political considerations have greatly influenced the selection of areas outside of Latin America. Friendly co-operation with Latin America should continue. Some control by the United States over the areas suggested should render Latin America even more secure than it now is from the standpoint of aggression on the part of unfriendly powers.

THE FUTURE POLICY OF THE UNITED STATES?

Assuming that the United States shall emerge victorious in the present conflict, one of three alternate post-war policies, or variations or combinations of them, may be logically followed by the United States:

1. An imperialistic policy of securing control of the necessary strategic and critical materials;
2. A continuation of the uncertain and ineffective policy immediately preceding the present struggle;
3. A positive policy based on a fair and equitable distribution of the strategic and critical materials among all nations, so that essential commodities would move freely between various parts of the world.

A. An Imperialistic Policy

Such a policy would not be conducive to the creating and perpetuating of friendly relations between all nations. There are many historical illustrations of this policy. An alternate policy of equitable peaceful distribution of materials would be far more conducive to world peace. However, the imperialistic type of policy does have a place under certain circumstances. When some strong nations follow such a policy, others may feel forced to adopt it in the interests of national defense. Under the stress of war, individuals and nations entertain noble proposals as to the type of society they are going to organize or set up on the culmination of the struggle. Such proposals and suggestions may range from absolute sincerity of purpose to deceptive propaganda to achieve certain aims. With the cessation of the fighting, the same individuals and nations only too often revert to the old policies of per-

petuation of their own selfish interests. Total world policy results from a mixture of idealism and realism.

B. Continuation of the Post-War Policy

It would, indeed, be unfortunate if, after engaging in a bitter struggle, the United States should again follow the haphazard and ineffective policy such as it pursued preceding the outbreak of the present struggle. Events of recent date render clear that such a half-hearted, uncertain policy of isolation is no guarantee against involvement in a major military struggle. Clear statements of policy on the part of the United States, especially in relation to specific areas, may forestall acts of aggression and enable it to avoid military entanglement.

C. A Policy of Fair and Equitable Distribution

In spite of the fact that considerable space in this paper is devoted to the consideration of other policies, the author sincerely hopes that the present struggle will culminate in an agreement by the nations of the world which will guarantee fair trade exchanges of the essential materials between the various parts of the world. The United States, in its position of world leadership, could encourage and possibly bring about the development of such a policy. Even if effectuated, it would require efficient administrative machinery to perpetuate it.

If past history has any lessons for the present generation, it appears that the United States should undertake to pursue the more or less imperialistic type of policy only if the world fails in setting up and making workable a policy of equitable distribution of essential materials. Certainly, without such a policy as the latter, it would appear that the nation has little in the way of logical alternatives. In any case, past experience appears to indicate that if the United States expects to be considered a leader among nations, it should follow some definitive and positive policy. Assuming American success in the present struggle, current information indicates that the United States could largely dominate future world policy if it had the will to do so. It is logical to hope that this great power should be devoted to the development of a better world in which individuals and nations may devote their best efforts to a peaceful progressive civilization.

THE GEOGRAPHER IN WAR TIME

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A good geography teacher should, by his teaching and leadership, enable his students to acquire a technique of geographic thinking. In this manner he can help to lay the foundation for a strong society in this world of turmoil. At these times, probably more than ever before, students have a right to expect straightforward thinking. The teacher should courageously attack new problems in his field and serve as a reliable source of information, inasmuch as that is possible. This will lead to the establishment of greater confidence in the minds of those who are being moulded into the citizens of tomorrow.

Today we have before us problems which have developed, either directly or indirectly, by the war. Some of these problems are new; others old. Some are academic; others, pure research. A large number of trained geographers and graduate students have accepted responsible positions in government service within the last two years. This is indicative of the importance of geographic training in modern warfare. However, we are far behind our axis enemies. For example, an outstanding German geographer has been one of Hitler's advisory group for a number of years, and one of the first steps taken after Hitler's rise to power was the establishment of the Geo-Politik Institute in Berlin. In reality this is a special university, composed largely of geographers, which has an integral part in the "superbrain" planning of German national policy. It has systematically collected and filed minute information of military and economic value pertaining to all parts of the world and soon after its formation a large meteorological station was created. The problems of the Institute are the problems of the Army, the Luftwaffe, and "blitzkrieg" warfare. The military and academic minds have been integrated. This body formulates broad strategic policies based upon geographic data; conducts research in the geography of land, sea, and air; and teaches geography to responsible officers of the entire German army.

WAR PROBLEMS OF THE GEOGRAPHY TEACHER

What are the current problems of the geography teacher? We can list a few: (1) Should students be encouraged to increase their study of geography? (2) How can our methods of presentation

best be adapted to the present needs? (3) How should the content of our courses be altered to serve our students most efficiently and to best meet the present emergency? (4) In the light of national defense, and offense, how essential is geographic research, and what should be the relative emphasis between our teaching and our scientific investigations? (5) More broadly, how can geography best aid in building the nation's strength? And of a more personal nature, (6) what will be the position of geography when the war is over? Will our science continue to grow as much in the next quarter century as it has in the last? Let us consider these questions individually.

Should Students Study Geography in War Time?

I believe geography is playing a very important role in the present conflict. A few trained geographers are holding responsible positions. Others are serving as consultants while retaining their peace-time positions. But equally important is the large number of geography teachers and graduate students serving behind the scenes. More significant, probably, is the fact that the demand for geographically trained men in government service is rapidly increasing.

In times of emergency our resources are strained and time is at a premium. We cannot afford to train inferior individuals. It is the superior student who can make the most important contribution, especially in research. However, there is a need for men having a practical familiarity with the subject, and these men need not always be of top rank. Furthermore, since our young men are being inducted into the armed forces at a very rapid rate, it appears that the opportunities for women with geographic training should increase proportionately. I make this statement despite the fact that many senior geographers and administrators feel that there is little opportunity for women geographers.

Methods of Presentation

Skill and care in teaching were never more important than today. Both the teacher's time and the student's time are valuable. The material should be worth-while and it should be presented in a manner in which it can be grasped clearly and quickly. It may be that the student is more familiar with place geography than was true a few years ago. If so, that is fortunate. However, I personally believe our students are still too prone to read news dispatches with little or no concern about the origin of the item or

the exact location of the places mentioned. The student could, in most cases, improve his class marks if he made greater use of his atlas—both when preparing his assignments and when reading the newspaper. I do not wish to overemphasize place locations, but geographic facts are the basis of the subject. The student cannot correlate or synthesize without data or information. However, these facts need not be handed out or rehashed in the classroom; that should occupy the preparation period. The class hour can then be utilized to compare, explain, and interpret the conditions portrayed. Not only does this get away from the monotonous and boring "what" and "where" questions that too often dominate the classroom procedure, but it keeps the student mentally alert. It allows him to apply himself. It encourages individuality, and discourages pure memory. It tends to set apart the true student from the one who may get good marks merely on the basis of a well-developed photographic mind.

The teacher should bring his classes up to date. This is especially true in courses in economic and regional geography. He can place greater emphasis on strategic and necessary raw materials. He can, from his own training and experience as well as from current articles and comments by responsible individuals, offer probable explanations and possible trends in our economic structure. The war supplies us with many new and pertinent illustrations. They should be neither overlooked nor ignored. They are a necessary part of courses of this nature, for the textbook, even tho recent, cannot be up to date in these times. However, we should not condole the practice of reading the daily headlines and then conducting the class lecture or discussion on that subject. Too few instructors and even fewer students are capable of justifying such a procedure. Even the outstanding student needs something tangible around which to orient his thoughts and discussion. A definite assignment is almost essential in courses presented below the graduate level.

What Courses Should Be Offered?

We need persons with all types and degrees of geographic experience. The most valuable men are those with a thoro general training and a definite knowledge of some specific region of the world. If the latter were obtained by foreign field experience, so much the better. Obviously, persons of these qualifications are rare. In some cases especial training in particular fields of the

subject will fit men for special positions whereby they may better assist in the military effort. In many of these instances classroom work or library research is quite adequate.

Among these special fields is meteorology and climatology, a recognized phase of geography. There are now five qualified departments of meteorology in the country,[1] but the subject has been expanded in many other colleges and universities. Its first impetus resulted from the introduction of the Civilian Aviation Authority (now Civilian Pilot Training) into our schools. Boys who expect to enter the air corps frequently elect a college course in meteorology, knowing it will simplify their later training. Hence, there is a place in every college (and some high schools) for introductory studies in this field, altho it appears that more and more of the aviation training is done directly by the army, and the more complete meteorology courses can best be handled in a few centers where specialists can give the men intensive concentrated training that will best fit their needs.

There appears to be a need for junior geographers in the government service. Some are working with or under the direction of specialists in the newly created agencies. Others have received positions as a result of the expansion of the geographic personnel in major governmental departments. These are not highly paid positions and, in most cases, do not appeal to men holding doctorate degrees. However, they usually require a broad systematic training in the field and frequently entail work that might be classified as supervised research.

Geography is a dynamic, growing subject. New courses are being introduced each year, especially in our high schools. This means that there is an increased demand for teachers. These teachers should have training in conservation as well as in physical, economic, and regional geography. It is also apparent that history and economic majors need general training in geography. To them, geography is secondary, but it should be considered essential.

Finally, there is now a demand for geography courses of a more or less cultural nature. New college offerings are entitled "Geography of the Pacific Realms," or "Geography of the War." Other schools are introducing courses in cartography or map interpretation. The latter sometimes includes the reading of aerial photographs. There is a need for cartographers during the present

[1] Massachusetts Institute of Technology, University of Chicago, California Institute of Technology, University of California at Los Angeles, and New York University.

emergency, altho it may be that few individuals will be able to qualify on the basis of a college course in the subject. Practice and experience, as well as aptitude, play significant roles in the moulding of a map maker. The map interpretation courses, whether or not they offer credit, are valuable, particularly to those men who expect to enter the armed services. To the general public they are purely cultural courses.

Research or Teaching

More and more, we must assure ourselves that our task is an essential one. Our more progressive men have usually conducted their normal teaching duties and yet contributed some time to personal research. Now teaching loads are being increased, vacations are shortened or eliminated, summer terms are being lengthened, and a leave-of-absence for personal research is almost nonexistent. Hence, the previous arrangement is certainly restricted if not impossible.

To those of us who have remained in the teaching field, our instruction has, we hope, opened a broader understanding of the world and an appreciation of its geography. Thru our students, we have contributed to the nation's strength. There is, however, the natural yearning to do something of a direct value, and an element of dissatisfaction in what appears to be merely a routine job. However, someone must continue to teach and few men are completing their training; a qualified replacement is extremely difficult to obtain.

Some geography teachers are especially qualified to work on specific government problems. We should, and undoubtedly shall, give them all possible aid. They are, in most cases, serving as specialists or consultants. They are twice fortunate: (1) They can make a definite and direct contribution to their country's need, and (2) they are deriving an experience that will prove profitable thruout their active life. But, whatever our position, all of us will need to work at maximum capacity. We must render every possible assistance to our federal government, and do it immediately.

Geography and the Nation's Strength

It should not be necessary to elaborate upon the numerous ways in which geographers are aiding the national effort. The current demand for geographers is indicative of their value. Those

who are directly engaged in the work are best able to tell what is being done. It will suffice to say that the geographic staffs in the State Department, Department of Commerce, and War Department have been augmented, the latter considerably. Geographers are to be found working in the Board of Economic Warfare, the Office of Strategic Services, the War Production Board, the Office of Price Administration, the Weather Bureau, and many other agencies. Geographers are teaching meteorology to air corps cadets and at naval training stations. Presumably the number of meteorology instructors will increase as the size of our armed forces mounts. Some of these will come from the five schools of meteorology, but it is my understanding that most of those who are attending those schools are being trained for forecasting and advisory work with the combat forces wherever they may be, rather than for instruction in the training camps. If so, more instructors must come from our civilian population. We have one task before us. That is to win the war. Those of us who remain in the colleges must perforce do double duty. But it will approach a calamity if our numbers are so greatly reduced that adequate teaching cannot be continued.

There is also another angle to this question—an over-all picture. We are confident of victory, but it will probably not come as quickly as many people anticipate. After military conflict ceases, regardless of the victor, there will be rival ideas at the peace table. It will be necessary to consider the human welfare of this country and the world. Our knowledge must be directed to the common good of all. That may not be easy, and at present is obscured by the more immediate task of aiding the military effort. However, it will be futile to win the war unless during its winning, we lay the foundation for the kind of peace and readjustment that will guarantee the preservation of those aspects of American life for which the war is fought.

If the "four freedoms" are to be permanently realized there must be a redistribution of the raw materials of the world on a basis that will provide equality of opportunity. Possibly this should involve a redistribution of the land opportunities of the world. (Some statesmen feel that peace will be precarious as long as one nation holds one-fourth of the earth's surface, even tho some of that vast domain is held "by consent.") We are agreed that our nation shall play a major role in whatever post-war adjustment is necessary. Then our nation must be able to offer a feasible, constructive plan and we, as citizens of that nation, must

devote our energies to its completion and adoption both at home and abroad.

What of the Future

Our students ask us, "What is the future of a geographer?" They remember the depression, when physical scientists were practically unwanted. Now they see a sudden demand because of the war but many may not complete their preparation before the war has ended.

After World War I our universities doubled their enrollment. The value of adequate education had made itself evident on all the young men who were fighting and on many of those who remained at home. Geography departments expanded their faculties as enrollment increased and as new courses were offered. New departments were organized where previously there had been none.

What then can we expect after the present war? There is, of course, the possibility of a post-war depression. If this should occur, it seems probable that the geographer will feel such a depression no more than those who have been trained in other fields. I believe our work is playing a rapidly increasing part in the nation's life. The growth of geography during the last two decades is indicative of this trend.

At present the demand for geographically trained personnel, both in teaching and in government service, is increasing at a very rapid rate. It may be that some geographic work must be curtailed during the present emergency. For example, as college enrollment declines fewer teachers may be needed. However, the potential value of geography in the business and commercial world is not generally known. Only recently has the geographer been able to effectively demonstrate his ability. A few, who have obtained a foothold, are now making splendid records. As they work into responsible positions we can expect requests for additional geographers. The same statements can be made with respect to some of the governmental agencies. Unfortunately, however, some departments of our government are still inclined to belittle the geographer and as a result offer him only inferior positions or none at all.

In conclusion, it appears that the geographer's role is on the upgrade; the trend is toward further emphasis on the subject. This trend may not necessarily continue, but any immediate variation should be of only a temporary nature. We have something to offer the world, surely it will reciprocate.

A ROLL CALL OF HONOR

Does your institution belong in this list?

An organization such as the National Council of Geography Teachers depends upon geographers to perform numerous services among which are assuming official responsibilities, reading papers before national conventions and preparing articles for publication in its official journal. Another service, membership support, tho not occupying as prominent a place as the other services just mentioned, it is nevertheless important because no organization can exist without membership support.

Consequently, in order to give due recognition to those geography staffs now loyally supporting the National Council of Geography Teachers, we are publishing a list of colleges and universities in which all full-time regular geography instructors are members of our organization. Undoubtedly, this honor roll is not complete. Tho letters of inquiry have been sent to all colleges and universities in the United States, replies have not come in from all. If your institution has earned a place on this list please notify us by writing to the Secretary of the National Council of Geography Teachers. Your institution will then be added to this honor roll.

Geography staffs with 100 per cent membership in the National Council of Geography Teachers are:

Alabama

Alabama College, Montevallo
Birmingham-Southern College, Birmingham
State Teachers College, Florence
State Teachers College, Troy

Arizona

Arizona State Teachers College, Tempe
State Teachers College, Flagstaff

Arkansas

Henderson State Teachers College, Arkadelphia

California

State College, San Jose
University of Southern California, Los Angeles

Connecticut

State Teachers College, Danbury

Florida

J. B. Stetson University, De Land

Georgia

Georgia State College for Women, Milledgeville

Illinois

Western Illinois State Teachers College, Macomb

Indiana

Ball State Teachers College, Muncie
Valparaiso University, Valparaiso

Iowa

Drake University, Des Moines

Kansas

State Teachers College, Emporia

Maryland

State Teachers College, Frostburg

Massachusetts

State Teachers College, Fitchburg
State Teachers College, Worcester
Mount Holyoke College, South Hadley
Teachers College, Boston

Minnesota

State Teachers College, Duluth
State Teachers College, Mankato
State Teachers College, St. Cloud
State Teachers College, Winona
Carleton College, Northfield

Michigan

Western Michigan College, Kalamazoo

Missouri

Harris Teachers College, St. Louis
Northwestern Missouri State Teachers College, Maryville
University of Kansas City, Kansas City

Nebraska

Nebraska Wesleyan, Lincoln

New Hampshire

Keene Teachers College, Keene
State Teachers College, Plymouth

New York

City Normal School, Syracuse
State Teachers College, Buffalo
Vassar College, Poughkeepsie

North Carolina

Duke University, Durham

North Dakota

State Teachers College, Valley City

Ohio

Ohio University, Athens
Western Reserve University, Cleveland
Wittenberg College, Springfield

Pennsylvania

State Teachers College, Mansfield
State Teachers College, West Chester
University of Pittsburgh, Pittsburgh

South Carolina

University of South Carolina, Columbia

South Dakota

Northern State Teachers College, Aberdeen

Tennessee

Peabody College for Teachers, Nashville

Texas

Southern Methodist University, Dallas
West Texas State College, Canyon

Virginia

Madison College, Harrisburg

Washington

Eastern Washington College of Education, Cheney

Wisconsin

State Teachers College, Oshkosh
State Teachers College, Platteville

Wyoming

University of Wyoming, Laramie

THOMAS F. BARTON, *Secretary*
Southern Illinois Normal University,
Carbondale, Illinois.

DRAW YOUR OWN BLACKBOARD MAPS!

ERWIN RAISZ
Institute of Geographical Exploration
Harvard University

The use of diagrammatic maps or cartograms in teaching geography is not a new idea. Indeed the very first school maps in history made in the 9th to 13th centuries in Moslem countries used this

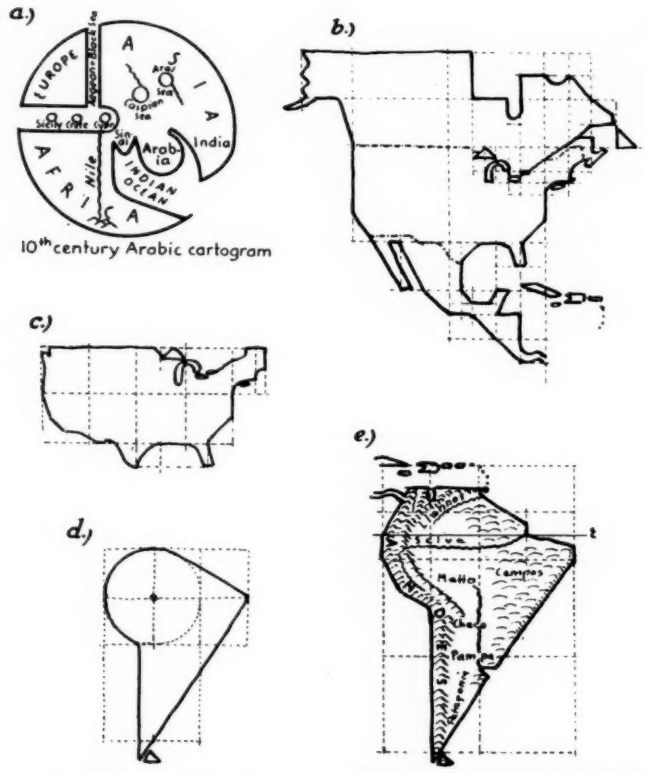

Fig. 1. Blackboard cartograms. Lay out the squares very lightly and draw the outline with very heavy lines. Basic geographic facts, such as climatic belts and vegetation zones can best be drawn with colored crayons.

device to acquaint the pupils with the relative location of the various countries (Fig. 1). In more recent times the mid-19th century geography textbooks often presented cartograms in which the outlines of countries and continents were pressed in geometrical forms. They used curved parallels however, and were so complicated that

the present author did not receive any helpful hints from their study.

The arguments for the use of hand-drawn cartograms in teaching need not be repeated here. They were ably presented by Helen Wright in her "Diagrammatic Map Making"; (Journal of Geography, v. 32, 1933; pp. 242-244), which article should be carefully read by every geography teacher.

The basic purpose of these cartograms is to present before the class simply and forcefully the basic geographic facts of the various units, such as climatic belts, vegetation zones, location of mountain belts, rivers, urban centers, agricultural regions, etc. It is true that all these elements can be drawn on a washable outline map where all the intricacies of the shore line are correctly shown. Yet just this correct detail makes them less useful. There is a discrepancy between the details of the shore line and the broad generalized belts placed upon them, which is confusing. Simplified facts on simplified outlines are better understood and better remembered. Washable outline maps, however, have their place in more advanced teaching.

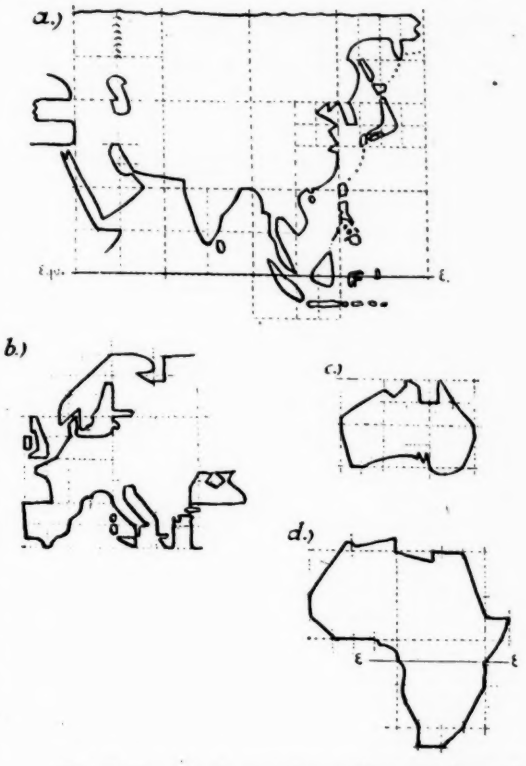

Fig. 2. Even such complex outlines as those of Europe and Asia can be easily copied from these sketches. The horizontal grid-lines are parallels, but the vertical lines are not meridians.

The outlines here presented, of course, are not the only ones and certainly not the best ones which can be drawn. Teachers with some drawing ability will produce much better outlines than these highly simplified ones drawn for the convenience of the less artistic. The system of drawing is so simple that nobody should have difficulty in drawing convincing outlines.

The continental outlines are drawn according to a sinusoidal projection which, with its horizontal parallels and tapering meridians, gives the simplest outlines and preserves the exact areas. They are drawn here at different scales but they can of course be drawn on any convenient scale. The United States is drawn on a rectangular projection, as this gives the simplest forms. Using curved parallels would make the drawings more complex.

All outlines are drawn on a grid of squares divided into half, quarter, even eighth squares, wherever necessary. The squares do not represent parallels and meridians; they are spaced for convenience in drawing only. Truly the horizontal lines are parallels as they represent the east-west direction, but the vertical lines are not meridians as they are not running north and south, especially in higher latitudes. The teacher does well in drawing the grid in very light lines and the outlines with very heavy lines preferably with soft yellow chalk. In filling in the detail, colored chalks will be of help. Blue wavy lines for rivers, brown for mountains, green for agriculture or forest, red for cities, boundaries and roads will make for not only more attractive but also for clearer maps.

TEACHING AIDS IN GEOGRAPHY

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Every teacher today must recognize the individuality of children. All have their different interests and abilities. It is necessary therefore to plan and adopt a teaching program that will offer opportunities for self-expression from each and every one of them. Probably no subject affords a better opportunity for individual expression than does geography. Consequently, today one finds every teacher of this subject employing many types of activity in order that an interesting program may be maintained.

For several years I have included in my program such activities as map making, graphs, plates, notebook outlines, floor talks, booklets, projects, and exhibits. It would be an exaggeration to claim credit for any originality in any of these activities, but perhaps I have suggested different names, and indicated in another part of this article some different ways of conducting old and familiar activities.

Because it is necessary to make use of a number of different activities, I thought it would be of interest to make some careful observations for the purpose of determining some basis for the evaluation of each as to its relative importance in my whole teaching program. I have based my results on the following considerations: pupil interest, pupil participation, pupil enjoyment, work accomplishment, and class instruction adaptation. It will be seen that the first three considerations are from the viewpoint of the pupil, and the last two from that of the teacher.

I have concluded that the following activities have the more important place in my teaching program. They are the booklet, the project, the exhibit, the plate and the floor-talk. The first three of these are eighth-grade activities and the remaining two are for the seventh grade. While map-making, graphs, and notebook outlines necessarily have an important place in my program, yet they seem to lack the popular appeal that the former group possesses.

It is quite understandable how the first group, namely, booklets, projects, exhibits, plates, and floor-talks have the more popular appeal when one considers that the pupil is given a large measure of freedom in working out these activities. To carry out the work of map-making, graphs, and notebook outlines, however, it is much

more necessary to give detailed instructions and to require a more strict adherence to them. For instance, map-making must be restricted to the carrying out of a very few definite instructions to prevent too much mapping of details. An overcrowded map loses its educational value. Graphs also require certain definite limitations to make them valuable, and certainly a notebook requires strict adherence to a topical outline.

Since I am convinced that activities of the first group have a more important place in my program, I am including a brief account of each.

THE BOOKLET

The booklet is exclusively an eighth-grade activity intended to summarize the economic geography of a country. Each pupil prepares a booklet of three loose-leaf pages and a cover. On the first page the pupil must show either by pictures, labels, cartoons (original), newspaper clippings, or advertisements what the country then being studied affords in agriculture. The second page must show manufacturing in the above manner; and the third page must show commerce in a similar way. The outside of the cover must bear the name of the country, the pupil's name, and may also show an appropriate design for the country.

This activity meets with a ready response from practically every pupil because it has enough breadth of selection to meet every pupil's fancy. However, this activity, in my opinion, can be made much more educational if the choice of selection is gradually limited in each succeeding booklet. This year, for instance, I require that after the first booklet all succeeeding booklets be compiled in the following manner. The agricultural page must show the existence of that occupation by pictures only. The manufacturing page must show this occupation by labels and advertisements; and the commercial page, by newspaper clippings. These limitations are imposed in the above manner so as to insure a wider range of selection by the pupil.

A bad feature in the above arrangements lies in the fact that some pupils will destroy a good book for the sake of a few suitable pictures. To avoid this tendency I insist that only old magazines or newspaper pictures will be acceptable. (Each pupil must give the name and date of any magazine used on the inside of the back cover.)

Altho I have given the foregoing instructions for succeeding

booklets, I am contemplating making one further change because of present world conditions. I shall have at least one booklet compiled by means of newspaper clippings only. I believe this type of booklet will serve a two-fold purpose. First, the habit of reading a newspaper will be encouraged, which, at this particular time, is one of the best ways of gaining an appreciation of the status of foreign countries. Second, it is an effective way to impress upon the pupil that our work in geography bears a direct relation to the work of the adult world.

Perhaps a few words as to the preparation of a news clipping booklet and its class adaptation are in order. It is quite apparent that this type of booklet is the most difficult for the pupil to appreciate and understand. This is evidenced by the fact that few pupils voluntarily make use of many clippings. However, this particular booklet of a country requires that the agriculture page contain only clippings that mention somewhere thruout the article some words or sentences that will lead the pupil to believe that the country engages in agricultural pursuits. Each of these words is underlined, and as a class exercise, all sentences containing underlined words are read to the class. This procedure allows the class to note such words or sentences as are related to agriculture, and to check them in accordance with the knowledge gained in class about that particular occupation. Often additional facts not brought out in class are obtained. The same procedure is followed for the pages on manufacturing and commerce.

I believe the booklet used in this manner is an activity that effectively summarizes the economic side of our geography teaching. Its research value or the ability acquired in selecting material is as important as the material found. Certainly emphasis on the newspaper as an important source of information and of gaining knowledge of the happenings of daily life is well brought out in this activity.

The Project

The project is the term I use for that activity in which the pupil prepares a talk and demonstration on some particular thing in which he is intensely interested. Often this activity may be the pupil's hobby. This work is the pupil's sole responsibility with practically no assistance from the teacher, and thereby justifies the name of project.

This is an eighth-grade activity and differs from the floor-talk

described elsewhere for the seventh grade in that the pupil, as mentioned above, is allowed all the freedom possible in the choice of his subject matter and his method of presentation to the class. The only limitation imposed is that the pupil must make out a few questions covering his demonstration to facilitate the verbal side of this activity. For example, one of last year's projects was on "safety glass" and the questions outlining this project were as follows: What is safety glass? How is it made? What is its use? Why can it be rolled up?

The boy who presented this project brought a piece of safety glass about a foot square to school and demonstrated its value by breaking it with a hammer and rolling it up. Needless to say, he made a deep impression on his classmates.

To show the variety of projects possible, a list of last year's projects is here included: The Piano—Its Composition and Tones. (In this project a girl brought a miniature piano to school and explained its construction and how a sound is produced when a key is struck. This girl was taking piano lessons.) How to Make Fist Puppets; Candid Cameras; Better Living Thru Chemistry; Modern Shoe Making; Uses of Mica; Baking Powder—Its Composition and Uses; Kinds and Uses of Coal; Polaroid; The Microscope —Its Construction and Use; The Cutting of a Pattern; Bemberg Rayon; Miniature Air Plane Engines; From Wheat to Flour; The Making of Toupees; Finger Printing; The Mechanics of Locks.

The above are a few subjects of the pupils' own selection. Each pupil not only demonstrated his interest but he knew the geography of it. That is, a pupil was required to identify all materials used and to know from what part of the world they came.

The values of this activity as an important aid to the teaching of geography are many. First, it gives the pupil an opportunity to contribute early in the course something of his own to the work of the class. (A project is accepted as soon as the pupil is ready.) Second, a variety of interests is introduced to the class. Third, it gives an opportunity for research, organization, and a display of individual technique. The amount of pupil ability often brought out in this type of activity is amazing.

The Exhibit

The exhibit is another eighth-grade activity. A corner of the room is reserved for this and it becomes a miniature museum. Most pupils seem to take a great delight in taking part in this activity.

Exhibits are set up for each country studied. Pupils from the several eighth grades bring in interesting objects for the exhibit table which are arranged by a committee composed of one member from each grade. In addition to arranging the objects the committee also compiles a list of all pupils contributing to it and labels each object with the pupil's name. A typical exhibit consists of articles of wearing apparel, embroidered scarfs, cutlery, musical instruments, newspapers, books, pictures, posters, stamps, crockery, etc. Because an exhibit carried on in the above manner has outgrown the amount of space allotted to it, I have had each eighth-grade class set up its exhibit separately, allowing one week for the exhibition. This method thus far has proved more interesting in that there is now introduced the element of room competition for the best display.

The value of this activity lies not only in the collecting and displaying of the objects, but also in the opportunity that it affords for classroom discussions. Many pupils are anxious to give a little history of their contribution as told to them by their parents. It is very gratifying to mention that often our foreign-born parents show much interest in this activity as evidenced by the value of articles some pupils bring.

I believe this activity to be of the highest value in that it can be a very tangible way of fostering a better understanding between the school and the home. Certainly if a parent feels that he is contributing something from the land of his birth to American culture he has a better feeling as to his worth to this country. Then, too, the children themselves can gain much along the lines of tolerance and respect for foreign countries represented by different pupils. Especially is this important at this particular time.

The Plate

The plate is a term given to the display of products of a state mounted upon a sheet of white map-drawing paper. Products in this activity may be represented by the product itself, if small enough, by labels, by pictures and by advertisements. This is a seventh-grade activity and is a forerunner of the booklet required in the eighth grade. The plate, altho composed of a single sheet of paper, has several features of the booklet pages, especially those of the page on manufacturing. The most notable difference is that no clippings are required.

A plate is prepared by the pupil at home as follows: after select-

ing the state of which he wishes to show the product, a collection of suitable labels and pictures gathered from newspapers, old magazines, wrappers and covers from packages, cans, etc. is pasted or attached to the drawing paper. Also a small map of the state is drawn somewhere on the plate so that the location of places from which the products come may be shown. The plates when completed are displayed around the room.

These plates, if well done, may be effectively used in classroom instruction to show that the actual product of a far-away state may be obtained by the pupil right here at home. He thereby gets a clearer concept of the product since it is often possible to have a sample of the real product on display.

This activity has an important place in my geography program in that it gives an opportunity to introduce a piece of work that calls upon the ability of the pupil to exercise his powers of discrimination and arrangement early in the course. All plates are prepared by the pupil at the same time a study is being made of a state or a group of states.

Plates on display are also used as a source of information for the active participation of the pupil in preparing a list of important cities. The cities are listed from those placed on the small map appearing on each plate. The preparation of a list of cities directly from the plates is an effective way of giving the pupil a clearer idea of what may constitute the importance of a city.

This activity is one that meets with a nearly 100 per cent response from the pupils of this grade. I attribute this to the carry-over of lower grade associations of cutting and pasting, but certainly it is a considerable step in advance when it is taken into consideration that a certain amount of research, arrangement, and map location of important cities is involved.

I justify the term plate for this activity from the pupil's knowledge of plates that occur in books.

Floor Talks

This activity is also intended for the seventh grade. The pupil is expected to prepare a talk on the dominant occupation of each of the four geographical divisions of the United States. When the major work of the class is about the Northeastern section of the country the talks are required at that time. The same is expected of the North Central, Southern, and Western sections.

These talks are given according to a prescribed outline for each section of the country. For example, the talks on New England are given according to the following outline: Name of Article; Name of Factory; Approximate Number Employed in Factory; Raw Materials Used; Where Raw Material is Obtained; Kind and Source of Power Used; Means of Transportation; How the Finished Product is Packed; Where the Finished Product is Sent to be Sold.

The pupil is advised to bring in any material he can get to illustrate any part of his talk. Altho these talks are due at the time the particular section of the country is being studied, they often extend into the next section to be studied, due to the unfamiliarity of this type of work. However, I do not find this offering any difficulties because those pupils who respond more quickly than others start immediately their preparation for a talk on the next section. This means that during the next section studied, there will be talks given on the preceding section which serve to refresh in the minds of the pupils the products of that section and thereby act as a review.

The outline for talks on both the North Central and Southern sections of the United States are similar due to the fact that agriculture is considered the dominant occupation in each. The outline is as follows: Name of Farm Product; How it is Produced; Climatic and Soil Requirements; Production Yield; How It is Marketed; Important Uses.

Floor talks tend to give the pupil confidence in his ability to stand before the class and talk. They also give him a sense of responsibility in that he is contributing something toward the conduct of the class work. Both of these attributes in my opinion justify this activity.

Summary

The foregoing is an attempt to give a comprehensive explanation of those activities which have proved most helpful in my teaching of seventh and eighth-grade geography. I have attempted to show why I consider them entitled to a more important place in my teaching program. While recognizing that not all is original on my part, I have endeavored to show why I have in some cases made use of different names for some familiar activities and how I have employed a different procedure in some cases.

Altho no one activity has had a 100 per cent response from all pupils, I can say without any reservations that every pupil has re-

sponded to a very satisfactory degree to at least one or more of the five activities described. Therein lies the value of a number of different activities comprising a teaching program. On the other hand, I have tried to recognize individual abilities by attempting to find out in what activities pupils show the highest degree of individual achievement and then fit those into my plan where they contribute most to my whole scheme of work.

I have purposely omitted any detailed explanation of map-making, graphs and notebook outlines for two reasons: first, I have not made any departure from the usual methods of procedure for these; and second, from a pupil standpoint, these occupy a minor place in my entire program.

THE 1940 POPULATION CENTER OF THE UNITED STATES

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Terre Haute, Indiana

It was, just a short time ago, one of the numerous fence posts which bounded a Sullivan County, Indiana, pasture. Then the Bureau of the Census of the United States Department of Commerce picked this particular post as the 1940 center of population for our country.

The particular post which marks the new population center stands beside blacktop State Road 58 two miles southeast of Carlisle, Sullivan County, Indiana (Fig. 1). The location is 35 miles southeast of Terre Haute and 20 miles northeast of Vincennes, Indiana. The westward movement of our population center, which began 150 years ago, continued during the past decade as the 1940 center is located 13 miles west and 7.9 miles south of the 1930 population hub. The latter point was 3 miles northeast of Linton, Greene County, Indiana (Fig. 1). According to figures released by the Bureau of the Census[1] the 1940 center of population is located in Latitude 38° 56′ 54″ North and in longitude 87° 22′ 35″ West.

[1] Unless otherwise stated all of the statistics presented in this article as well as the two map reproductions were taken from a recent press release by the Bureau of the Census, United States Department of Commerce and are used by permission of the Director of the Bureau of the Census.

An examination of Fig. 2 shows a steady westward movement of the gravitational center of the country. The total westward advance during the past 150 years has been 602 miles or an average of 4.01 miles per year. The average movement per decade has been 40.13 miles. The greatest advance for any one decade was that from 1850 to 1860 when the center moved 80.6 miles westward. The decade from 1910 to 1920 experienced the least advance, a movement of only 9.8 miles. It may also be noted from Fig. 2 that since

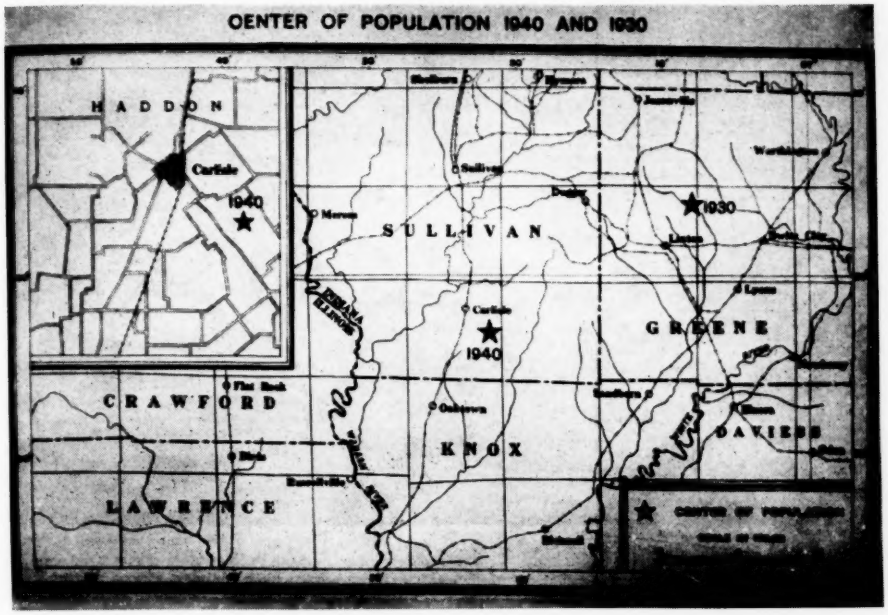

Fig. 1

1890 the westward march has decreased sharply. This decrease has been especially notable since 1910. In fact, the entire east-west distance between the 1910 center and the 1940 center was approximately 55 miles or only 15 miles greater than the average for each decade. The great westward movement between 1850 and 1860 was probably due largely to the fact that the states of Ohio, Indiana, Illinois, Iowa and Missouri experienced a rapid influx of people. The gold rush to California was also a significant factor. Since 1910 the increased growth of industry and the steady growth of urban population in the East has been significant in causing the westward march of the population center to be retarded.

Further study of Fig. 2 reveals that altho there was a steady longitudinal advance westward of the population centers the lati-

tudinal movement was comparatively small. The 1940 hub represents the most southerly location of any center since its inception in 1790, 150 years ago. The most northerly point was the first, or 1790 location which was 23 miles east of Baltimore, Maryland. This was, however, less than a mile north of the 1800 center located 18 miles west of Baltimore. The difference between the 1790 and the

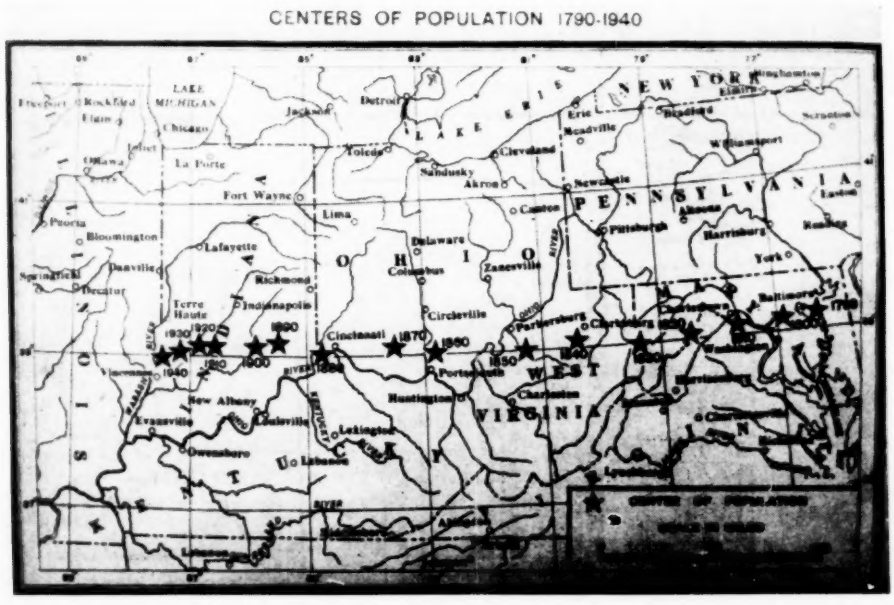

Fig. 2

1940 hubs was, however, comparatively slight, it being only 22.5 miles.

It was stated above that the most southerly point reached was the 1940 center. This point was, however, only slightly more than a mile south of the 1830 center as the latter lay exactly one minute of latitude south of the 1940 hub.[2] From an examination of Fig. 2 it is seen that from 1790 to 1830 the population centers moved steadily southward. This can probably be explained by the fact that the cotton producing states, the lower Mississippi River valley and the Lexington and Nashville basins were experiencing a more rapid population growth than areas north of the Ohio River. After 1830 a decided latitudinal fluctuation can be noted in the westward movement of the population centers. The mid-western states, Texas and

[2] The data presented in this paragraph are those of the author but are based upon the statistics published by the Census Bureau.

Arkansas were settled more rapidly after 1830. Increased railroad construction in the mid-western and lake states also aided in checking the southwesterly march. The greatest latitudinal fluctuation occurred during the decade 1860 to 1870 when the center moved north slightly over 12 miles. At no other time during the entire 150 year period did the hub move more than eight miles either north or south. This sharp northward movement was due largely to the rapid settlement in that decade of northern Illinois, southern Minnesota, Wisconsin and eastern Iowa. The least north-south movement took place between 1790 and 1800 when the center moved south approximately one mile. It is interesting to note that the greatest southward swing during the 150 years occurred from 1870 to 1880 immediately following the decade which experienced the greatest northward march.

The state of Indiana has claimed the hub of the nation's population for the past 50 years. In 1890 the gravitational center moved northwestward from a point in northern Kentucky, about eight miles southwest of Cincinnati, Ohio, to a location approximately 20 miles east of Columbus, Indiana. Since 1890 the center has moved steadily across the state. The 1940 hub is approximately eight miles from the western boundary of Indiana. Based upon the past shifts of the population centers the 1950 location will have moved across the Wabash River into the state of Illinois. Only a decided shift in the distribution of population will prevent Illinois from claiming the 1950 center of population of the United States.

The following table taken from the Bureau of Census statistics presents the approximate location of the population center of the United States for each decade from 1790 to 1940.

Year	*Approximate Location*
1790	23 miles east of Baltimore, Maryland
1800	18 miles west of Baltimore, Maryland
1810	40 miles northwest by west of Washington, D.C. (In Virginia)
1820	16 miles east of Moorefield, West Virginia
1830	19 miles west-southwest of Moorefield, West Virginia
1840	16 miles south of Clarksburg, West Virginia
1850	23 miles southeast of Parkersburg, West Virginia
1860	20 miles south by east of Chillicothe, Ohio
1870	48 miles east by north of Cincinnati, Ohio
1880	8 miles west by south of Cincinnatti, Ohio (In Kentucky)
1890	20 miles east of Columbus, Indiana
1900	6 miles southeast of Columbus, Indiana
1910	In city of Bloomington, Indiana
1920	8 miles south-southeast of Spencer, Indiana
1930	3 miles northeast of Linton, Indiana
1940	2 miles southeast by east of Carlisle, Indiana

ANNUAL MEETING NATIONAL COUNCIL GEOGRAPHY TEACHERS

The Twenty-ninth Annual meeting of the National Council of Geography Teachers will be held at Ohio State University, Columbus, Ohio, on December 30, 31, 1942, and January 1, 1943. The Association of American Geographers will hold its meeting at the same place on December 20-31, 1942. Both organizations will be guests of the Geography Department of Ohio State University. Professor Guy-Harold Smith is in charge of local arrangements.

Hotel Headquarters will be in the Deshler-Wallick Hotel. Single rooms may be secured ranging from $3.00 to $7.00; double rooms range from $5.00 to $10.00. Large capacity rooms accommodating 4 to 10 persons are from $2.00 to $2.50 per person depending upon the number of occupants per room. The Annual Banquet ticket is $2.00, this includes such items as tips, flowers, decorations, and tax.

THOMAS F. BARTON, *Secretary*
Southern Illinois Normal University
Carbondale, Illinois

EDITORIAL NOTES AND NEWS

We are now entering another school year in which winning the war will occupy a large part of our thinking and of our teaching. Teachers thruout the country will be wanting material that they can use. This is a globular war and there are many areas, regions and commodities about which students and teachers will want to know more than is available in the ordinary school texts. The JOURNAL would like to be of maximum service to you. Will you kindly drop us a postal card indicating the type of information that you would like to have? We are endeavoring to provide articles that will be of maximum help to you. Many such articles have appeared in the past and you can get much assistance from the previous issues of the JOURNAL. Numerous manuscripts are in our files and will be published during the present school year. Please do not lay this request aside and think that you will write some other day. Please remember that it takes considerable time to locate an author who can prepare the material which you desire. Will you, therefore, please write us at once? Address your communication to the editorial office, JOURNAL OF GEOGRAPHY, State Teachers College, Mankato, Minnesota.

A new bridge across the Niagara River below the falls replaces the old one destroyed by the ice jam of 1938.

According to the Department of Commerce, the natural gasoline industry supplies vitally significant basic materials used in the production of high-octane aviation gasoline and the production of synthetic rubber. Natural gasoline is prepared from natural gas.

"Geography in Education" is the theme of the Field Service Bulletin of the Illinois State Normal University, Vol. V, No. 1, September, 1941. The articles were prepared by the staff of the Department of Geography and Geology.

The National Park Service, United States Department of the Interior, has recently issued two series of historical publications, which are available at small cost from

the Superintendent of Documents. They contain historical and archeological source materials and excellent photographs.

According to the Bureau of Reclamation, United States Department of Interior, Parker Dam is the world's deepest dam. Workmen dug 235 feet below the bed of the Colorado River before pouring the concrete foundation. Parker Dam is 155 miles downstream from Boulder Dam. Its main purpose is to supply a billion gallons of water daily to the Metropolitan Water District of Southern California, an incorporated union of thirteen cities centering about and including Los Angeles. Other purposes of the dam are to aid Boulder Dam in flood control of the Colorado River; to afford water storage for the hydroelectric power plant being erected at the dam site; and to help regulate the supply of water for diversion at Imperial Dam, 153 river miles below Parker Dam. The control of the Colorado River may be summarized as follows. Boulder Dam is the site of the great hydroelectric power plant with its far-flung transmission lines including those to the Los Angeles area. Parker Dam is the intake of the Colorado River Aqueduct which extends 242 miles westward to Lake Mathews, the great storage reservoir from whence the water goes thru a 150 mile distribution system to the Coastal Plain cities, after passing thru a water softening and filtration plant. The power development at Parker Dam will be principally of local use and for distribution to Phoenix and Blaisdell, Arizona, centers for the Salt and Gila river projects, respectively. The Imperial Dam site is the intake for the All American Canal to the west, and its offshoot, to the Imperial Valley, the Coachella Canal, as well as the Gila Canal to the area tributary to Yuma.

A conference on "Social Education in Wartime and After" will be held in New York City during the Thanksgiving holidays, November 26-28. The conference will constitute the twenty-second annual meeting of the National Council for the Social Studies. Government officials and social scientists will meet with teachers from elementary and secondary schools to consider what policies and practices should govern social-studies teaching in the United States during the war. Conclusions of the conference will subsequently be published by the National Council. Anyone interested in attending all or part of the conference should write for further information to Wilbur F. Murra, executive secretary, National Council for the Social Studies, 1201 Sixteenth St., N.W., Washington, D.C.

School Life, the official monthly journal of the U. S. Office of Education, was discontinued in February for the war duration. A new bi-weekly, *Education for Victory,* 16-32 pages, printed on newsprint, replaces it.

Formerly known as Magallanes, Chile, this city is to be called Punta Arenas, its former name. The city can now be reached by a combination rail and motor bus service from Buenos Aires in addition to the usual sea route thru the Strait of Magellan.

The Trans-Andean Railway tunnel on the railroad between Valparaiso and Buenos Aires has recently been opened to motor traffic. The tunnel is about two miles long, nearly fifteen feet wide, and almost two mile above sea level. Motor vehicles are thus saved a steep climb of more than 3,000 feet to the crest of the pass, where snow often causes serious blockades for many months of the year. The Trans-Andean Highway between the above-mentioned cities is about 900 miles long. Discussion is heard of a five-mile tunnel much lower than the railway tunnel to be used in this important link in the South American section of the Pan American Highway.

HELEN L. SMITH of the Department of Geography, University of Wisconsin, has joined the staff of the Wilson Teachers College, Washington, D.C., replacing Ovid McMillion, who has entered war service.

The National Geographic Society of Washington, D.C., resumes publication of its weekly bulletins for teachers—the *Geographic School Bulletins*—for the 1942-43 school year beginning in October. The bulletins are issued weekly, five bulletins to the weekly set. They give information about boundary changes, explorations, new industries, and achievements in engineering developments. They also describe areas affected by the war and economic conditions. All are illustrated from the Society's vast photographic collection. Their cost merely covers the mailing charges.

KATHERYNE T. WHITTEMORE, State Teachers College, Buffalo, New York, was called to Albany by the Chief of the Curriculum Bureau to assist in the preparation of the new elementary school outline.

Have you a copy of *The Romance of Rubber?* This 46-page book on the history, manufacture and other phases of rubber may be had free to schools for classroom use from the United States Rubber Company, Rockefeller Center, New York City.

HARLAN H. BARROWS was the guest of honor last spring at a dinner given by University of Chicago geographers in Washington, D.C. About forty people were in attendance. Major John W. Coulter, University of Hawaii, was master of ceremonies and Lt. Col. Sidman P. Poole, Syracuse University, was toastmaster. Others paying tribute to Mr. Barrows were Helen M. Strong and Eugene Van Cleef. Mr. Barrows traced the development of the Department of Geography at Chicago and sketched the outlook for the future of the Department and the University.

The 1942 Mainliner Teacher's Kit contains a 52-page booklet of aviation facts and figures; 24 pictures of historic and present day planes and air travel; an airline map of the United States; sheets of various service stickers; and suggestions for the use of the materials in the kit. The kit is available from United Air Lines, Chicago, Illinois, at a nominal cost. The Manual is edited by William A. Wheatley, Director of School and College Relations, United Air Lines.

Department of the Interior geologists announce rich iron deposits on Kasaan Peninsula, southeastern Alaska, less than 700 miles by inside passage from Seattle. The iron content of the samples is appraised as high as 60 per cent. The cheap power at Grand Coulee and Bonneville may make these extensive deposits of national significance.

"Rubber's Return to the Western Hemisphere," is the title of a 4-page leaflet sent free by the Goodyear Tire and Rubber Company.

The ninth annual meeting of the New York Geographical Association will be held November 7, in the Industrial Arts Building, State Teachers College at Oswego, N.Y. The day's program includes a presentation of papers and discussion thereof, a luncheon, a field trip in the local area, and an informal dinner with Guy-Harold Smith as the guest speaker whose topic is, "Geo-politics, a plan for a New World Order."

GEOGRAPHICAL PUBLICATIONS

Otis W. Freeman and Howard H. Martin, Editors. **The Pacific Northwest, A Regional, Human, and Economic Survey of Resources and Development.** 542 pp., references, maps, index. John Wiley, New York City, 1942.

Economic Atlas of the Pacific Northwest. Northwest Regional Council, Portland, Oregon, 1942.

The Pacific Northwest bears many resemblances to *New England's Prospect, 1933,* which appeared a decade ago as Special Publication 16 of the American Geographical Society. Each volume encompasses a group of states which, by common consent, form a unified region. The new volume, like its predecessor, is a cooperative undertaking to which specialists in many fields, as well as geographers, make contributions. In subject-matter also the two volumes are roughly comparable.

In organization, *The Pacific Northwest* is strictly orthodox. Part I, "Changing Human Adjustments," provides historical background, perhaps exceeding the necessities by an opening discussion of Northwestern Indian culture. Part II adequately summarizes the physical environment, mainly its landforms and climatic factors. "Exploitation and Conservation of Natural Resources," forming Part III, includes descriptions of the soil types, natural grasslands and forests, as well as a discussion of soil conservation, mineral wealth, fisheries, water resources, and tourism. Parts IV and V contain factual accounts of agriculture, manufacturing industries and commerce. The text concludes with two interesting chapters on population. Folded in the back cover is a landform map prepared by Erwin Raisz after a field survey of the region in the summer of 1940. The maps and illustrations distributed thruout the text have been well chosen and are clearly reproduced.

The work as a whole, prepared by over thirty authors, is a valuable addition to geographical literature. It is a kind of compendium which, only occasionally, becomes a mere recital of facts. General readers, recognizing its dominant textbook characteristics, may give it less attention than it deserves.

In the spirit of the contributors to *New England's Propect* who tried "not to advertise New England nor to glorify it, but to see it as it is," the editors and authors of *The Pacific Northwest* were concerned with a modest presentation of resources and of problems, and their geographical background. But no one will deny that the region contains spectacular features often justifying superlatives and, perhaps also, the frequent use of the word "unique." To a cantankerous pilot, possibly, the Northwest coast would appear "island infested" (p. 46). Generalized forest types are represented in Fig. 83, p. 264, not original grasslands as is suggested on p. 148. Good usage seems violated in referring to Portland, at a stage in its growth, as possessing "urbanity," (p. 501). Many strange results have been accredited to the Federal Reclamation Act of 1902 but there is little to support the view (p. 235) that this act marked the beginning of an adjustment of land policy to western conditions and that after its passage the Northwest "developed agriculture on a more extensive scale." The hybrid term "intermountain" is unfortunately used thruout the volume. Minor blemishes such as these can scarcely be avoided in a work of this magnitude.

The second edition of the *Economic Atlas of the Pacific Northwest,* published in 1942, contains twenty-four maps, 12 by 14 inches in size, each accompanied by a text. Many of the maps have been reproduced, in smaller size, in the volume above reviewed, and most of them are suitable for hand coloring. "Topographic relief" is of the hypsometric type, which has the advantage of showing approximate altitudes, but often fails to distinguish significant contrasts. The Raisz map would be a suitable companion for it. Population is

treated in three plates, one of which shows the present distribution by proportional circles and dots; the others (eight map-diagrams) represent migration to the Pacific Northwest from 1870 to 1930. Population migration is shown by means of flow lines, with numerous short tributaries, sweeping in broad curves across the country. The text accompanying the maps in this series fails to explain the method of construction which, presumably, will puzzle readers who give them more than a casual glance. "Net emigration" in the decades following 1910, for example, is far from clear. Climatic maps show annual and warm-season precipitation, and the average frost-free season. Three maps are devoted to the forests, "the most valuable single resource of the area." One of the most valuable maps, at least to the regional specialist, is "crop land and land development areas." In contrast with this one is the map of "power facilities," which classifies electrical power lines on a basis satisfactory to the Bonneville Power Administration, but scarcely meaningful to geographers and general readers. The new edition, with its additional eight maps and especially with the explanatory and descriptive text, remedies the principal deficiencies of its predecessor, which was published in 1941.

RALPH H. BROWN

University of Minnesota

Virginia Lloyd Hunt. **How to Live in the Tropics.** 178 pp. Harcourt, Brace and Company. 1942. **$2.00**

Chapter headings in "How to Live in the Tropics" include the following topics: Preparations, Climate, Environment, Daily Routine of Keeping Fit, Victuals and Drink, Hobbies, Women, Children and Servants, Insect Enemies, Communicable Diseases, Home Nursing, Emergency First Aid and Where to Look it Up.

Without reading very far one may discover that the book is obviously written for popular consumption and contains little of value to people with sound geographical background. Style is readable, but meaning is vague in many sentences.

On the fly-leaf, the publishers state that "Here is the first American handbook to cover fully the practical problem of living in the tropics." The significance of this statement depends on the connotation of the word "fully." To the reviewer much of the subject matter is covered sketchily—for example the chapters on "Climate" and "Victuals and Drink." A few sections receive better treatment—for example the chapter on "Daily Routine of Keeping Fit." One of the best features of the book is the frequent specific reference to source material used in preparing the study.

For the layman who plans to live in the tropics, or even in the little known sections of the sub-tropics or temperates, the book may contribute some worthwhile suggestions.

EARL B. SHAW

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National Wildlife Conservation Stamps. Sponsored by National Wildlife Federation, 1212 Sixteenth St. N.W., Washington, D.C. 1942. **$1.00** a sheet of 64 stamps.

Fifth annual issue of stamps, each stamp depicting in color one species of plant or animal life.

Nicholas John Spykman. **America's Strategy in World Politics.** 500 pp. Illustrated. Harcourt, Brace and Co., N.Y. 1942. **$3.75.**

A study of the problems of isolation versus intervention as they apply to the basic issues in the foreign policy of the United States. The position of the United States is analyzed in terms of power politics and geographical location.